



**Biological Assessment
For the
Colorado Department of Transportation State Highway 83 Castlewood Canyon
Bridge Reconstruction Project
Douglas County, Colorado
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Lead Agency: Colorado Department of Transportation

Cooperating Agency: Federal Highway Administration

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1.0 Description and Proposed Action

The Colorado Department of Transportation (CDOT) is proposing the reconstruction of the State Highway (SH) 83 historic bridge structure at Castlewood Canyon. Located on the Russellville Gulch quad (UTM Zone/E/N 13/522940/4353020), at an altitude of 1964 meters (6460 feet), this bridge spans Cherry Creek and is located on CDOT right-of-way (ROW) in Douglas County. Reconstruction of the bridge will increase the roadway width from 9 to 12 meters (30 to 40 feet) and increase the length of the bridge from 114 meters to 123 meters (376 to 406 feet).

2.0 Introduction

This Biological Assessment (BA) was prepared to assess the impacts of reconstructing the bridge by the CDOT on SH 83 south of Franktown on the Preble's (Preble's) meadow jumping mouse (*Zapus hudsonius preblei*). On 13 May 1998 the U.S. Fish and Wildlife Service (USFWS) listed Preble's as a threatened species under the Endangered Species Act (ESA) of 1973 (as amended). Preble's are known to occupy the project area.

3.0 Consultation History

A field meeting was held with representatives of CDOT and USFWS on 6 November 2002 to discuss how construction of the project could be accomplished with no effect to the species. At this time discussion was limited to night work and associated lighting, and how to prevent material from falling into the canyon. After the meeting the determination was made by CDOT Staff Bridge that examination of bridge footings is necessary. To access the footings fill material would need to be excavated and that would require a small tracked backhoe be lowered into the canyon at the north and south footings. On 17 December 2002 another meeting was held to determine how the project could be completed while minimizing impacts to Preble's habitat yet allowing for footing work. The determination was made that a Biological Assessment of the project's impact on Preble's was necessary that made the determination of 'may affect, likely to adversely affect.' On 23 December 2002 the site was re-visited by CDOT personnel to determine the amount of space necessary for footing excavation and repair and storage of excavated material.

4.0 Proposed Management Action

The Colorado Department of Transportation (CDOT) is proposing the reconstruction the State Highway (SH) 83 historic bridge structure at Castlewood Canyon. Located on the Russellville Gulch U.S. Geological Survey quadrangle map (UTM Zone/E/N 13/522940/4353020), this bridge spans Cherry Creek and is located on CDOT right-of-way (ROW) in Douglas County. Reconstruction of the bridge will increase the roadway width from 9 to 12 meters (30 to 40 feet) and increase the length of the bridge from 114 meters to 123 meters (376 to 406 feet). Some vegetation will be impacted during construction, however areas impacted currently are sparsely vegetated or vegetated principally with smooth brome (*Bromus inermis*). Impacts will be temporary and confined to areas near the north and south bridge footings. The project will directly impact habitat within the canyon during the period of 1 March 2003 through 30 April 2003.

The project is located in Douglas County approximately 5 miles south of Franktown on SH 83. Bridge structure G-18-BL spans Cherry Creek on the eastern edge of Castlewood Canyon State Park. The Cherry Creek Bridge (G-18-BL) is a concrete two-rib open-spandrel arch that was completed in 1948. It was listed on the National Register of Historic Places in October 2002 (NRHP 2002) for its role in the development of transportation in the region, and for its structural configuration. The open-spandrel concrete arch is one of the most distinctive of highway bridge types. Despite their appeal, open spandrel arches were used infrequently on Colorado's highways and today only six remain in use. With its 70.5-meter (232-foot) span, the Cherry Creek Bridge is by far the longest of the concrete arch bridges in Colorado. Exposure to

the environment has lead to the concrete on the structure becoming weathered and deteriorated. Continued deterioration of the structure would make it unsafe for use. The structure has been patched in the past but these areas are now in need of additional repair (Photo 1). Because of the historical nature of this structure repairs instead of replacement is necessary.



Photo 1: The arrows point to examples of the deterioration that has and is occurring on the bridge structure.

The project as proposed will remove the existing superstructure including columns, piers, girders, and the roadway in its entirety. The roadway width will increase from 9 to 12 meters (30 to 40 feet). The existing arches and struts will remain as a historic conservation measure and will be retrofit by patching the damaged concrete areas and wrapping with a carbon fiber to provide additional exterior strength to the structure. In order to achieve the required exterior strength, the arches must be exposed to the top of the foundations and then repaired and wrapped. Since the existing arches are being repaired rather than replaced, the disturbed areas are being significantly minimized, as a new arch would have required extensive work across the canyon bottom.

The project timeline is as follows:

- Advertisement 6 February 2003
- Notice to Proceed (award of contract) 26 March 2003, no later than 23 April 2003
- Excavation/backfill, repair and wrapping of the arch between 26 March and 30 May 2003
- Construction of the superstructure (existing columns, girders, roadway, and guardrail) will occur between 30 May and 30 September 2003.
- Closure of SH 83 30 May 2003 (no earlier than)
- Opening of SH 83 30 September 2003 (no later than)
- Completion of other roadway items (topsoil, seeding and mulching, signing, etc.) 30 September through 30 October 2003.

Excavation of the arch foundation footers and associated work (excavation, drying of footers below the existing ground line, patching, carbon fiber wrap installation, backfill and topsoil/reseeding) is estimated to not exceed two weeks' time. The application of topsoil, seed material, tack and mulch and blankets if necessary shall be completed after spring thaw to 15 June 2003. If spring thaw occurs prior to the backfilling of the arch footers then topsoil and reseeding will occur simultaneously with the backfilling of the arch footers. Once the work is completed at the arch footers the construction zone will be lessened to 2.4 meters (8 feet) out from the arch footers and remain throughout the construction period. This construction zone will be delineated using orange fencing.

The north arch foundations are partially exposed and as such will not require significant excavation. The estimated amount of material excavated is approximately 153 cubic meters (200 cubic yards). A small tracked backhoe will be lowered from the bridge deck to the canyon bottom using a large crane. Bare, rocky areas exist directly adjacent to the arch foundations; however, the existing topography slopes rapidly away from the foundation and does not permit a platform for a small tracked backhoe to operate on. The ground immediately west of the foundation will be leveled for use as a work pad. This requires that a disturbance area large enough to operate the tracked backhoe needs to exist. The disturbance area will be used for the maneuvering of the backhoe on the west and south sides of the structure and also as storage for the removed fill material. The estimated area of disturbance is 299 square meters (3250 square feet) (Photo 2 and attached site diagram). The existence of large boulders on the surface adjacent to the arch will necessitate a requirement in the plans for the contractor to develop a procedure to contain the excavated material. This will ensure that these boulders do not roll into the bottom of the canyon. This could be accomplished by utilizing portable pre-cast concrete barrier or by creating an earthen berm.



Photo2: This photo shows the primary and secondary disturbance areas at the south footer. The arrow is intended to show that the primary disturbance area continues west to the canyon wall. For additional clarification please refer to the attached disturbance area diagram.

The top of the south arch foundations are buried approximately 3.6 meters (12 feet) deep. The required excavation will be approximately 306 cubic meters (400 cubic yards) of material. To limit impacts two

areas were delineated for use on the south side; these are noted as primary and secondary disturbance areas (Photo 3). The primary area will be the main work zone on the south side. This is where the backhoe will be lowered into the canyon and also where fill material shall be stockpiled until placed back in the area from which it was excavated. The secondary impact area will only be used if there is more fill material excavated than what can be stored in the primary area. The estimated area of the primary disturbance area is 290 square meters (3150 square feet) and the secondary area is estimated at 56 square meters (610 square feet) (see attached site diagram). The existing topography around the south arch foundations is generally flat with a slight slope adjacent to the arch and does not have the large boulders found at the north footing location.



Photo 3: This photo shows the maximum disturbance area for the north footers.

5.0 Species Considered and Species Evaluated

The following table lists threatened, endangered, proposed, and candidate species for Douglas County that must be considered for this project.

Table 1. Federally listed, candidate and proposed species potentially occurring in the project area. Species that do not exist in the project area are discussed no further.

Species	Status	Habitat Requirements	Potential for Occurrence
Fish			
Greenback cutthroat trout <i>Oncorhynchus clarki stomias</i>	FT	Cold, clear, gravely headwater streams and mountain lakes that provide an abundant food supply of insects.	Does not occur near the project area. Below the altitudinal range.
Pallid sturgeon <i>Scaphirhynchus albus</i>	FE	Meandering, braided channels and backwaters that provided different depths and flow velocities in the Missouri river.	Does not occur near the project area. Project will not impact water sources that are part of the South Platte River

			system.
Birds			
Bald eagle <i>Haliaeetus leucocephalus</i>	FT	Open water bodies, prairie dog colonies important food source during the winter.	Does not occur in project area.
Mexican spotted owl <i>Strix occidentalis lucida</i>	FT	Rocky canyons or forested mountains below 2,888 meters (9,500 feet) altitude. Nests in standing snags and hollow trees.	Does not occur in the project area, not appropriate habitat.
Mountain plover <i>Charadrius montanus</i>	FP	Shortgrass prairie with bare ground and plants less than 10 centimeters (4 inches) in height (Kingery 1998, USFWS 2002a).	Does not occur in the project area, not appropriate habitat.
Mammals			
Black-footed ferret <i>Mustela nigripes</i>	FE	Prairie dog towns in the Great Plains, montane basins, and semi-arid grasslands.	Does not occur in the project area, not appropriate habitat.
Black-tailed prairie dog <i>Cynomys ludovicianus</i>	FC	Open prairie with non-sandy soils.	Does not occur in the project area, not appropriate habitat.
Preble's meadow jumping mouse <i>Zapus hudsonius preblei</i>	FT	Riparian areas with lush vegetation.	Known to occur within the project area.
Plants			
Ute ladies'-tresses orchid <i>Spiranthes diluvialis</i>	FT	The riparian habitat on which this species depends has been drastically modified by urbanization and stream channelization for agriculture and development. Most surviving populations are small and appear to be relict in nature.	The project will not impact wetlands, no effect to <i>Spiranthes</i>
Colorado butterfly plant <i>Gaura neomexicana ssp. coloradensis</i>	FT	Colorado butterfly plant is an early successional species (although probably not a pioneer) adapted to periodically disturbed, subirrigated stream channels with short vegetative cover.	The project will not impact wetlands, no effect to <i>Gaura</i>
Invertebrates			
Pawnee montane skipper <i>Hesperia leonardus montana</i>	FT	Found in dry, open Ponderosa pine woodlands with sparse understory at 1829 to 2286 meters (6,000 to 7,500 feet) with moderately steep slopes with soils derived from Pikes Peak granite.	Does not occur in the project area, below the altitudinal range.

FE = Federally Endangered
 FT = Federally Threatened
 FC = Federal Candidate
 FP = Federally Proposed

Of the 11 federally listed, candidate, and proposed species potentially occurring in the project area, only Preble's has suitable habitat in the project area. Further evaluation of the project's impacts on Preble's is found in the "evaluated species information section".

5.1 Preble's meadow jumping mouse, *Zapus hudsonius preblei*, Federally Threatened.

This section summarizes pertinent Preble's life history information, including general ecology and habitat requirements. Subsequent subsections address Preble's natural history, habitat requirements, and critical habitat.

5.1.1 Natural History

The Preble's meadow jumping mouse is a member of the family Zapodidae. This family is characterized by long tails and hindlegs with large hindfeet adapted for saltatory (jumping) movement. This is an old family, having first arisen during the Oligocene (40 million years ago). Zapodids typically are found in areas with lush herbaceous vegetation (Fitzgerald et al. 1994).

Burrows and nests are used as night and day beds. Day nests are constructed out of grasses, forbs and other available plant material. Day nests are found in both riparian and upland habitats. Typically they are found under debris at the base of shrubs or trees or in open grasslands (Ryon 2001). Each nest may be used once or up to a week before being abandoned.

Preble's are true hibernators and usually enter into hibernation in September or October and emerge in May of the following spring. When an individual enters hibernation is based on body fat reserves, adults generally enter into hibernation prior to juveniles as they have greater body fat reserves. Mortality can approach 70 percent during hibernation, probably as a result the rapid weight loss that occurs when first entering dormancy (Fitzgerald et al. 1994). Hibernacula occur both within and outside of the 100-year floodplain. Fifteen hibernacula have been discovered through radio telemetry, all were within 78 meters (260 feet) of a perennial streambed or intermittent tributary (Bakeman and Deans 1997, Shenk and Sivert 1999a, Schorr 2001). One excavated hibernacula was located 30 centimeters (12 inches) below the surface in coarse textured soil and was constructed of leaf litter (Bakeman and Deans 1997).

Mating can occur at any time that individuals are not in hibernation, though most breeding occurs between early June and mid-August (Fitzgerald et al. 1994). Most females have two litters per year but three is not uncommon (USFWS 2002b). Litter size is usually five, though it can vary between two to eight young (Quimby 1951, Whitaker 1963). For being a small mammal Preble's are long lived. In Boulder County Colorado seven individuals that were initially caught as adults were re-captured 2 years later. This means that these individuals were at a minimum 3 years of age at re-capture (Meaney personal communication). Mortality is greater in the summer than during hibernation (USFWS 2002b).

Diets of meadow jumping mice in general are governed more by availability than preference (Shenk 1998). Grass seeds from a variety of species tend to be the most important component of the diet and mice shift preference to those species that are in seed. The diet shifts seasonally; it consists primarily of insect and fungus after emerging from hibernation, shifts to fungus, moss, and pollen during mid-summer (July – August), with insects again added in September (USFWS 2002b). Preble's regularly use uplands at least 100 meters (330 feet) beyond the 100-year floodplain (UFWWS 2002b).

5.1.2 Habitat Requirements

Habitat for the Preble's meadow jumping mouse along the Front Range of Colorado into Wyoming typically consists of a matrix of riparian vegetation and associated upland grasslands and shrubs (Fitzgerald et al. 1994; Shenk and Sivert 1998). These systems are relatively narrow and represent a small percentage of the landscape (USFWS 2002b). Riparian vegetation typically is varied with a mixed overstory comprised of willows (*Salix* spp.) and cottonwoods (*Populus* spp.) and an understory of scattered shrubs including snowberry (*Symphoricarpos* spp.). Two major habitat components appear necessary; open water and dense cover. Both of these are within the project area.

In addition to these habitat features suitable habitat must also provide requirements for survival throughout the life cycle (Shenk 1998). This means that habitat for the active period and hibernation period are essential. Active period habitat must provide areas where reproductive activities and daily survival can occur. Hibernation habitat is not just that habitat in which hibernacula are created but also provides adequate food sources for fat storage during hibernation. Habitat for active and hibernating periods do not have to occur in the same location but must be connected.

Threats to Preble's and their habitat include alteration, degradation, loss, and fragmentation resulting from urban development, flood control, water development, agriculture, and other human land uses. Habitat destruction may impact individual Preble's directly or by destroying nest sites, food resources, and hibernation sites, by disrupting behavior, or by forming a barrier to movement (USFWS 2002b). Invasive non-native and noxious weeds can alter habitat and decrease its value. Habitat is maintained over time along rivers and streams by a natural flooding regime that periodically scours riparian vegetation, reworks stream channels, floodplains, and benches, and redistributes sediments such that a pattern of appropriate vegetation is present along river and stream edges and throughout floodplains (USFWS 2002b).

Primary habitat constituent elements (USFWS 2002b) for Preble's include:

- Dense riparian vegetation consisting of grasses, forbs, and shrubs in areas along rivers and streams that provide open water through the Preble's active season.
- Adjacent floodplains and vegetated uplands with limited human disturbance.

- Areas that provide connectivity between and within populations.
- Dynamic geomorphological and hydrological processes typical of systems within the range of Preble's, i.e., those processes that create and maintain river and stream channels, floodplains, and floodplain benches, and promote patterns of vegetation favorable to Preble's.

5.1.3 Designated Critical Habitat

Critical habitat is defined in section 3(5)(A) of the Endangered Species Act (ESA) as (i) the specific areas within the geographic area occupied by a species, at the time it is listed in accordance with the Act, on which area found those physical or biological features (I) essential to conserve the species and (II) that may require special management considerations or protection; and (ii) specific areas outside the geographic area occupied by a species at the time it is listed, upon determination that such areas are essential to conserve the species. Habitat that is not designated as critical is still important and necessary for the recovery of a listed species. On 17 July 2002 the USFWS published in the Federal Register proposed designation of critical habitat for Preble's. Within Douglas County Recovery Unit SP11 encompasses approximately 703 ha (1,738 acres) on 32.1 kilometers (19.9 miles) of streams within the Cherry Creek Watershed (USFWS 2002b). This area includes portions of Castlewood Canyon State Park from the downstream boundary of the state park upstream to the confluence of Lake Gulch and Cherry Creek. The project area does not fall within this boundary.

6.0 Environmental Baseline

The environmental baseline identifies the current status of, and effects on, the species in the action area. This should be the current condition of the habitat, including all impacts that have occurred or are occurring to the species up to the time of the proposed action subject to consultation.

The project area is located in the eco-region identified as the Southern Rocky Mountain Steppe – open woodland- coniferous forest – alpine meadow province of the dry domain (Bailey 1995). This eco-region is characterized by annual temperatures ranging from 2° to 7° C (35° to 45° F), a considerable amount of precipitation is in the form of snow and can equal up to 102 cm (40 inches) per year (Bailey 1995). Vegetation changes with altitude, the project area lies at approximately 1,964 meters (6,460 feet) above mean sea level. Vegetation at and around the project area is characterized by an upland dominated with scrub oak (*Quercus* spp.), ponderosa pine (*Pinus ponderosa*), sumac (*Rhus* spp.), and snowberry. Riparian vegetation includes willows (*Salix* spp.), sedges (*Carex* spp.) and rushes (*Juncus* spp.).

The native habitat in which the action area is located provides good to excellent habitat. The project area itself is directly adjacent to and below SH 83. Habitat available in and around the project area is mainly riparian, use of uplands by Preble's is limited in the project area as a result of high cliffs.

7.0 Effects of the Action

7.1 Direct Effects

The direct effects of the proposed action are those that would directly result from USFWS approval of the project under consideration. Specifically, the project action would result in 645 square meters (0.15 acres) of temporary habitat disturbance. These temporary disturbance areas do not offer prime habitat for Preble's. The north temporary disturbance area is mainly exposed soil with rock ranging in size from gravel to small boulders. There is little vegetation under which day nests could be built. Vegetation is predominantly smooth brome, which may be used by Preble's for some foraging (Michael personal communication). The disturbed area on the south side has more smooth brome and less of a grade than the north side. A few small shrubs exist within this area that could be used as day nests and some foraging probably occurs within this area. Both the north and south temporary impact areas are near enough to Cherry Creek that they could be used as hibernacula, though more suitable areas do exist nearby. This project will require leveling of the slope at the north footer, excavation and temporary storage of fill

material at the footer locations. Noise will increase in the canyon during excavation and backfilling of the footers, removal and replacement of the bridge deck, and refurbishing and wrapping of the support arches. Night work will be allowed and will add additional noise at night that currently does not exist.

Night work could affect Preble's as a result of the increase in noise and human activity. To minimize this impact light work will not occur more than four consecutive nights with three consecutive nights of no night work.

7.2 Indirect Effects

Indirect effects are those secondary and subsequent effects that are reasonably certain to occur as a consequence of the proposed project. Future development at the project area and within Castlewood Canyon State Park will not occur as a result of this project. There will be no indirect effects to any of the federally threatened, endangered, or candidate species described in Table 1.

7.3 Cumulative Effects

Cumulative effects are defined under section 7 of the ESA as

Those effects of future State or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation. [50CFR §402.02]

Cumulative effects only involve future actions, "past and present impacts of non-Federal actions are part of the environmental baseline. Future Federal actions requiring separate consultation (unrelated to the proposed action) are not considered in the cumulative effects section" (USFWS 1998). Section 7 only requires consideration of future private actions that are reasonably certain to occur.

No future impacts to this part of Castlewood Canyon State Park are identified and are unlikely to occur.

8.0 Conclusion

Of the 11 species mentioned in Table 1, 10 are not likely to occur within the project area. The proposed action will have **no effect** on the greenback cutthroat trout (*Oncorhynchus clarki stomias*), pallid sturgeon (*Scaphirhynchus albu*), bald eagle (*Haliaeetus leucocephalus*), Mexican spotted owl (*Strix occidentalis lucida*), mountain plover (*Charadrius montanus*), black-footed ferret (*Mustela nigripes*), black-tailed prairie dog (*Cynomys ludovicianus*), Ute ladies'-tresses orchid (*Spiranthes diluvialis*), Colorado butterfly plant (*Gaura neomexicana ssp. coloradensis*), and the Pawnee montane skipper (*Hesperia leonardus montana*).

The Preble's meadow jumping mouse (*Zapus hudsonius preblei*) occurs in the project area. The direct and indirect effects on Preble's are not discountable or insignificant.

8.1 Recommendations and Conservation Measures

Conservation measures are actions taken by the action agency "to benefit or promote the recovery of listed species that are included by the Federal agency as an integral part of the proposed action. These actions will be taken by the Federal agency or applicant, and serve to minimize or compensate for, project effects on the species under review. These may include actions taken prior to the initiation of consultation, or actions which the Federal agency or applicant have committed to complete in a biological assessment or similar document (USFWS 1998)."

To limit the effects of this project on Preble's the following actions are part of the project:

- Work areas provided to the contractor in the Landscape sheets are maximum disturbance areas. Construction zones shall be minimized to the maximum extent possible. Disturbance in these areas are temporary and these areas shall be re-vegetated with upland species favored by Preble's.
- The site shall be monitored for three (3) years post construction to determine the success of the revegetation. During this time control of noxious weeds shall be required. Noxious weeds must be less than 5% of the foliar cover after 3 years shall be the determination of successful weed control. After three (3) years of monitoring if 70 per cent or greater of plantings have survived and 70 per cent or greater of the disturbed area is re-vegetated with favorable species and as determined by foliar cover, then the site shall be declared successfully reclaimed.
- All work zone boundaries shall be fenced with orange fencing to keep equipment and personnel within the established construction zones.
- No construction personnel, material, or equipment shall be allowed beyond the work area as shown in the Landscape plans. If any construction personnel, material, or equipment enter restricted areas or disregard the conditions set forth in the plans, the Engineer shall immediately suspend the work wholly or in part until appropriate approval from the USFWS is granted. Work shall not commence until the contractor has submitted, and is granted approval, a written plan detailing how no further incursions into the restricted area occur. Work shall not resume until the plan is approved in writing. Any additional costs incurred as a result of the said plan shall be absorbed by the contractor and any delays in work shall be a non-excusable delay.
- Silt fencing and rock fall barriers shall be installed and maintained during all footer work. At completion of the footer work these shall be immediately removed. Silt fence and barriers must be acceptable to the Engineer and CDOT Environmental staff.
- If night work is necessary lights shall not be directed downward at the lower third of the valley floor nor the valley floor upstream or downstream of the bridge. Lighting shall only be directed toward the area of construction.
- Night work shall not exceed four consecutive nights of work followed by three consecutive nights of no work. Any night within the consecutive work period that the Contractor elects not to work shall be counted as a consecutive night worked.
- The Contractor shall prepare and submit an acceptable lighting plan to the Engineer and CDOT Environmental staff. The plan must include at a minimum: descriptions and sketches of the layout of the light towers including spacing, luminary height, lateral placement and anticipated luminance provided; physical specifications of all lighting equipment; a detailed description of all lighting to be used on construction equipment; and methods utilized to minimize illumination on the restricted lower third of the valley floor area.
- During demolition of the bridge deck and associated components materials shall not be allowed into the canyon. A debris management plan must be submitted to the Engineer for written approval.
- If any of the above stipulations are not adhered to the Engineer shall stop work immediately and work shall not resume until the Engineer and the USFWS approve a corrective plan. The costs of the forgoing requirements shall be the responsibility of the Contractor.

9.0 Mitigation Measures

The disturbed areas will be enclosed with orange construction fence and erosion logs. The Contractor will not be permitted to enter the area beyond this fence. The site will be reclaimed utilizing 6 inches of topsoil and will be seeded, mulched, tacked and blankets will be utilized on slopes greater than two horizontal to one vertical. The proposed mitigation will improve the existing conditions as the current area is strewn with rock from the original construction and the mitigation will improve the quality and quantity of vegetation.

During the three (3) years post construction that the site is monitored for re-vegetation mitigation for the unusable habitat shall be 'banked' at the Plum Creek Preble's bank. This location must be used as there are no on-site locations nor locations close to the project area that CDOT could use as mitigation (whether it be in the form of protective buying or habitat enhancement). Compensation for the temporary loss of habitat

will occur at a 1.5:1 ratio. This means that until re-vegetation is successful on-site at the temporary disturbance areas the Plum Creek bank shall have 971 square meters (0.24 acres) of credit removed. Once on-site mitigation is successful then the bank would receive these credits again for use toward required mitigation for other projects.

10.0 Effect Determination

As a result of the employed conservation measures and mitigation this project may affect and is likely to adversely affect the Preble's meadow jumping mouse. This project is expected to temporarily have a 'may affect, likely to adversely affect' impact on Preble's.

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